

Application: 10/605,516

Igor Touzov

Page 2 of 4

## Claims

### Claim 1 (Originally filed)

Method of measurement of characteristics of a body, wherein said body comprises periodic array of more than two geometrically equivalent elements, and some or all of said elements can be absent at some moment of time, and said method comprises following:

- i) digital acquisition of some fragments of image from video source at first moment of time
- ii) digital acquisition of same fragments of image from video source at second moment of time
- iii) comparison of individual image fragment taken at first moment of time with individual image fragment taken at second moment of time for the same fragment, wherein said comparison uses at least one pixel from said first image fragment and at least one different pixel from said second image fragment.

### Claim 2 (Originally filed)

Method of claim 1 where said image fragments are directly extracted from digital video stream.

### Claim 3 (Originally filed)

Method of claim 1 where said image fragments are extracted from whole single frame of digital video stream.

### Claim 4 (Originally filed)

Apparatus implementing method of claim 1 and comprising:

- i) laser light source and collimator
- ii) spatial light modulator capable of splitting of single monochrome light beam into ordered plurality of light beams
- iv) objective lens
- v) video capture device capable of acquiring optical images.

### Claim 5 (Originally filed)

Apparatus of claim 4 further comprising microarray of lenses.

### Claim 6 (Originally filed)

Method of measurements of characteristics of a body, wherein said body comprises periodic array of more than two geometrically equivalent elements, and some or all of said elements can be absent at some moment of time, and said method comprises following:

- i) source of laser radiation
- ii) optical elements capable of focusing said radiation onto surface of said body
- iii) optical image capture device

Application: 10/605,516

Igor Touzov

Page 3 of 4

- ii) digital acquisition of some fragments of image from said capture device at first moment of time, where in said fragments contain distribution of light intensity of a beam reflected from said focal location of said body
- iii) digital acquisition of same fragments of image from said capture device at second moment of time, where in said fragments contain distribution of light intensity of a beam reflected from said focal location of said body
- iv) comparison of individual image fragment taken at first moment of time with individual image fragment taken at second moment of time for the same fragment, wherein said comparison uses at least one pixel from said first image fragment and at least one different pixel from said second image fragment.

**Claim 7 (Originally filed)**

Method of claim 6 where said image fragments are directly extracted from digital video stream.

**Claim 8 (Originally filed)**

Method of claim 6 where said image fragments are extracted from whole single frame of digital video stream.

**Claim 9 (Originally filed)**

Apparatus implementing method of claim 6 and comprising:

- i) laser light source and collimator
- ii) spatial light modulator capable of splitting of single monochrome light beam into ordered plurality of light beams
- vi) objective lens
- vii) video capture device capable of acquiring optical images.

**Claim 10 (Originally filed)**

Apparatus of claim 9 further comprising microarray of lenses.

**Claim 11 (Originally filed)**

Method of claim 6 further comprising scanning of said body surface with respect to said focusing optical elements.

**Claim 12 (Originally filed)**

Apparatus of claim 9 or claim 10 further implementing method of claim 10 and further comprising lateral positioning stage with positioning plane parallel to said objective lens/lenses.

**Claim 13 (Currently amended)**

Method Apparatus implementing method of claim 1 to supply data for feedback control controlling operations of plurality of micromechanical or micro electro-mechanical elements representing parts of single device, wherein said method comprises:

- i) use of laser light source with output power more than five (5) milliwatt
- ii) splitting said light onto plurality of beams

Application: 10/605,516

Igor Touzov

Page 4 of 4

iii)controlling propagation of said beams using electronically controlled optical switching device  
iv)focusing said beams onto surface of said device.

**Claim 14 (Currently amended)**

Apparatus implementing method of claim 136 to supply data for feedback control  
and comprising:

- i)laser light source
- ii)plurality of optical elements
- iii)electronically controlled optical switching device.

**Claim 15 (Originally filed)**

Method of measuring deformations of plurality of microcantilevers that employs method of claim 6.

**Claim 16 (Currently amended)**

Apparatus of claim 13 wherein said mechanical elements are microcantilevers  
and Method of creation of controlled deformation of microcantilevers that  
comprises:

- i)~~array of microcantilevers~~, wherein each cantilever has light beam focused in its surface
- ii)said light beam is modulated by intensity ~~using pulse width modulation~~, wherein change in modulation~~ed width~~ results in change of deflection of said cantilever.

**Claim 17 (Currently amended)**

Apparatus Method according to claim 16 further employing method of claim 15, wherein same light beam used in both methods.

**Claim 18 (Currently amended)**

Apparatus Method according to claim 17 that employs measurements of method of claim 6 to establish feedback that controls cantilever deflection.

**Claim 19 (Currently amended)**

Apparatus Method of claim 16 providing generation of resonance oscillation of  
said micro cantilever element, wherein said cantilever comprises body and attached integral lever, and wherein said method process comprises:

- i)first radiation beam focused on surface of said cantilever and modulated with first frequency
- ii)optional second radiation beam focused on surface of said cantilever and modulated with second frequency
- iii)said frequencies are adjusted so one of them or their harmonics nearly match resonance frequency of said micro cantilever.

**Claim 20 (Currently amended)**

Apparatus that implements method of claim 19 capable to produce oscillation of  
plurality of cantilever elements.